I hereby certify that this correspondence is being deposited with the United States Postal service as first class mail postage prepaid in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on or before the date noted below my signature.

Daniel B. Ruble Registration No. 40,794 DATE: ~~March 6, 2006~~ March 8, 2006

In The United States Patent and Trademark Office

Applicant:	Grah et al	Group Art Unit:	1772
Serial No.:	10/749,451	Examiner:	P. Butler
Filing Date:	December 31, 2003	Docket No.:	D-43584-01
Title:	Method of Shrinking a Film		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Declaration of Grah and Havens Under Rule 1.132

Our names are Michael D. Grah and Marvin R. Havens. We are the inventors of the above-identified patent application. We are both currently employed by the Research and Development Department of Cryovac, Inc., the owner of the above-identified patent application. We were both employed by Cryovac, Inc. in that Department while making the inventions claimed therein.

U.S. Patent Application Publication 2004/0241482 was filed June 2, 2003 by Michael D. Grah and Kelly R. Ahlgren. The '482 publication is owned by Cryovac, Inc. Kelly Ahlgren is also employed by the Research and Development Department of Cryovac, Inc.

Before the filing date of the '482 publication, Grah and Havens conceived the subject matter disclosed in the '482 publication paragraphs 0014-0017, 0029, 0041-0043, 0051, and 0138 that is directed to the idea of incorporating single-walled carbon nanotube material in one or more layers of a film and subsequently irradiating the film. See the Disclosure of Invention by Michael Grah entitled "Shrink film that contracts when exposed to intense light" attached as Exhibit I. Each of the dates deleted from Exhibit I is before the June 2, 2003 filing date of the '482 publication.

The subject matter disclosed in the '482 publication paragraphs 0014-0017, 0029, 0041-0043, 0051, and 0138 that is directed to the idea of incorporating single-walled carbon nanotube material in one or more layers of a film and subsequently irradiating the film is a

description of our previous work.

The undersigned Declarants acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. All statements made of the Declarants' own knowledge are true. All statements made on information and belief are believed to be true.

MICHAEL D. GRAH

Date: 3/6/06

MARVIN R. HAVENS

Date: March 7, 2006

DisclofInvDuncanRev799.dot

EXHIBIT I

[redacted]

CRYOVAC
Sealed Air Corporation

CONFIDENTIAL
DISCLOSURE OF INVENTION
TO
CRYOVAC, INC.
LAW DEPARTMENT

[redacted] DATE RECEIVED: INITIAL: _____	**DO NOT WRITE IN THIS SPACE**	**DISCLOSURE NO.** D-43584-00

Title of Invention: Shrink film that contracts when exposed to intense light

Inventors:
(Printed Full Names) Michael Grah

I. Summarize the invention in broad terms.

This invention is a biaxially oriented shrink film with one or more layers containing a fine dispersion of single walled carbon nanotubes (SWNTs). The nanotubes are dispersed to the extent that optical transparency is maintained. When the film is exposed to intense light, the SWNTs heat up, and transfer that heat to the adjacent polymer. The polymer is heated to the extent that the glass transition temperature is exceeded, and the film shrinks.

II. Please describe the invention in detail in your own words. Use sketches, graphs, or data as appropriate.

Recently Ajayan et.al. demonstrated that single walled carbon nanotubes ignite when exposed to a photographic flash (Science, V. 296, P. 705, April 26, 2002.) In air, the average light power necessary to ignite the SWNTs was found to be ~100 mW/cm^2. Further, when SWNTs were subjected to a photographic flash in inert atmospheres, extensive structural reconstruction of the SWNTs is observed. This requires that the nanotubes reach a temperature of at least 1500°C. These temperatures are sufficient to vaporize polymer adjacent to the nanotubes.

The object of this invention is a biaxially oriented shrink film where the 'contracting' layer contains a well dispersed concentration of SWNTs. The fine dispersion of nanotubes allow the film to maintain a high level of transparency. When this film is exposed to a source of intense light, the SWNTs convert that light into heat with high efficiency. Under well controlled conditions of light intensity and duration, the heat generated by the SWNTs can maintained at a level below the decomposition point of the resin adjacent to the SWNTs. Over a period of time the SWNT loaded layer will heat up until its temperature exceeds the glass transition temperature of the polymer. The film will then contract to the thermodynamically favored structure.

III. How does the invention compare with previous processes, machines, or compositions? What comparative tests were run and what were the results?

No tests have been conducted. The finding by Ajayan et.al. is unprecedented, and it provides a unique tool that can be used to develop a light activated shrink film.

IV. A. Describe the specific problem addressed by the invention and how the invention solves the problem.

Today, shrink films require some medium to transfer heat via convection to the shrink layer of the film. This process requires significant time, line space, and energy. Further, in the case of shrink bags for many meat products, a water tunnel is necessary to achieve acceptable levels of heat transfer and line speed. In both cases, as the shrink film is heated, the underlying product is also heated. In the case of fresh meat, transfer of heat into the produce has undesirable consequences.

B. What are the advantages of the invention?

This invention overcomes the limitations of the above described processes by generating the heat necessary to unlock the shrink film within the film itself. Negligible heat is transferred into the underlying product. Further, a heat transfer medium is not required, so the process becomes much simpler and more cost effective. The rate of heat production and ultimate temperature achieved by the shrink film can be accurately controlled by the intensity and duration of light radiation.

V. It is expected that a prior art search will be conducted prior to submission of this disclosure. Please provide the results of this search and a brief description of the methods used to conduct the search. Indicate what you consider to be the closest prior art and describe how your invention differs. Attach copies of relevant art such as patents, journal articles, advertising brochures, or a description of prior commercial products. (Note: Prior commercial products and processes should be indicated, where appropriate, as prior art.).

Nanotubes in a Flash – Ignition and Reconstruction. *Ayayan, P.M., et.al., Science (2002), 296, 705. This is the article that stimulated this invention.*

Electromagnetic wave-absorbing reactive materials, molded products of them, and their use. *Harakawa, Kenichi; Saito, Toshio; Murai, Nobuyoshi. (Takenaka Komuten Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho (2000), 9 pp. CODEN: JKXXAF JP 2000204272 A2 20000725 Patent written in Japanese. Application: JP 99-8322 19990114. CAN 133:121136 AN 2000:501910 CAPLUS*

Patent Family Information

Patent No.	Kind	Date	Application No.	Date
JP 2000204272	A2	20000725	JP 1999-8322	19990114

Abstract

Heat-curable or -shrinkable resin matrixes contain and disperse materials which convert electromagnetic energy to heat. Precise bonding, molding, and repairing in machinery or construction can be performed by the use of the reactive materials. Thus, silicone rubber contg. 1.0 vol.% carbon fiber was applied to a crack of a concrete block and irradiated with electromagnetic wave so that the crack was completely filled with cured silicone rubber.

Device for absorbing electromagnetic rays and their transformation into thermal energy, kinetic electrical energy, ionization energy and into other forms of energy. *Pohlack, Hubert. (VEB Carl Zeiss Jena, Ger. Dem. Rep.). Fr. Demande (1981), 11 pp. CODEN: FRXXBL FR 2464486 A1 19810306 Patent written in French. Application: FR 80-9218 19800424. Priority: DD 79-212541 19790427. CAN 96:107201 AN 1982:107201 CAPLUS*

Patent Family Information

Patent No.	Kind	Date	Application No.	Date
FR 2464486	A1	19810306	FR 1980-9218	19800424

Priority Application Information	
DD 1979-212541	19790427

Abstract

A device for the absorption of electromagnetic waves, such as a photoelec. detector and solar energy converter, comprises several layers. Two of these layers are transparent to electromagnetic waves, and 1 layer is slightly transparent or opaque. The latter consists of individual layers of low and high n that are placed alternately below an absorbing layer.

Easy removal of pressure sensitive adhesives for skin applications. *Chivers, R. A. Smith & Nephew Group Research Centre, Heslington, York, UK. Int. J. Adhes. Adhes. (2001), 21(5), 381-388. CODEN: IJAADK ISSN: 0143-7496. Journal written in English. AN 2001:650155 CAPLUS Discusses degradation of adhesive polymers by irradiating the polymer with UV light.*

Investigations into the mechanism of adhesion of a novel light-deactivatable pressure-sensitive adhesive. *Chivers, R. A.; Webster, I. York Science Park, Smith and Nephew Group Research Centre, Heslington, York, UK. Adhesion '99, International Conference on Adhesion and Adhesives, 7th, Cambridge, United Kingdom, Sept. 15-17, 1999 (1999), 37-42. Publisher: IOM Communications Ltd., London, UK CODEN: 69AXE8 Conference written in English. CAN 135:77776 AN 2001:73211 CAPLUS*

Effect of ultraviolet light irradiation on gas permeability in polyimide membranes. 1. Irradiation with low pressure mercury lamp on photosensitive and non-photosensitive membranes. *Matsui, Shigetoshi; Ishiguro, Takayuki; Higuchi, Akon; Nakagawa, Tsutomu. Department of Industrial Chemistry, Meiji University, Kawasaki, Japan. J. Polym. Sci., Part B: Polym. Phys. (1997), 35(14), 2259-2269. CODEN: JPBPEM ISSN: 0887-6266. Journal written in English. CAN 127:279126 AN 1997:627101 CAPLUS Gas permeability reduced by UV light induced crosslinking of the polymer.*

Manufacture of self-cleaning glass, and the glass obtained. *Heller, Adam; Paz, Yaron; Haruvy, Yair. (Heller, Adam, USA; Paz, Yaron; Haruvy, Yair). PCT Int. Appl. (1997), 47 pp. CODEN: PIXXD2 WO 9707069 A1 19970227 Designated States W: AL, AM, AT, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ, DE, DE, DK, DK, EE, EE, ES, FI, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM. Designated States RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT. Patent written in English. Application: WO 96-US12792 19960806. Priority: US 95-2504 19950818. CAN 126:228543 AN 1997:238431 CAPLUS Titania with photocatalysts breaks down dirt and grime on a window surface when struck by light.*

Reversible changes in the permeability of polymers to gases during exposure to g-rays. *Tikhomoirova, N. S.; Malinskii, Yu. M.; Karpov, V. L. Doklady Akad. Nauk S.S.S.R. (1960), 130 1081-4. Journal language unavailable. CAN 56:32036 AN 1962:32036 CAPLUS No abstract available, but energy source is gamma rays, not relevant for activation with visible light.*

VI. **Please answer the following:**

A. **When did you first think of this invention?** [redacted]

B. **To whom did you first disclose this invention?** *Marv Havens and Kelly Ahlgren*

C. **On what date did you make such disclosure?** [redacted]

D. **When and where did you make the first written description of the invention?**

This document

E. **When did you first do any actual work toward carrying out the invention?**

No work done yet

F. **Is future work on this invention planned?**

Yes, I want to experimentally demonstrate the feasibility of this concept. The purpose of this invention record is to document the date of invention.

G. **What records do you have to substantiate your answers to questions A-F and the other information provided in this disclosure? (e.g., notebook page numbers, technical reports, monthly reports, technical project authorizations, letters and memos, files, engineering drawings, etc.) - PLEASE ATTACH A COPY.**

This document.

H. **Are there other Disclosures of Invention submitted to the Patent Department or in preparation that tie in closely with this invention? Give details.**

NO

I. **Has a machine, product or process based on this invention been offered for sale, sold, used commercially or described in any publication? Yes or No:** No

If yes, give dates and to whom: N/A

Is future use or sale planned? *I hope so*

If yes, when and to whom: *We don't know yet*

J. **Give dates and details regarding samples, information or publications relating to this invention which have been or will be given to persons outside Cryovac, Inc. Has the invention been discussed with any person other than an employee of Cryovac, Inc.?**

No

K. **Do any products of this invention contain experimental resins or involve the use of equipment which may be covered by secrecy agreements with the resin supplier, equipment manufacturer, or another third party? If so, please indicate the resins, resin supplier, or equipment manufacturer and the relevant agreement.**

No

SIGN NAMES IN FULL - DATE ALL SIGNATURES

Printed Full Name: Michael Grah	**Printed Full Name:**
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Michael Grah [redacted]	
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Title:	**Title:**
Signature **Date**	**Signature** **Date**
Citizenship:	**Citizenship:**
Residence Address:	**Residence Address:**
Mailing Address:	**Mailing Address:**

This disclosure of invention has been read and thoroughly understood by me.

Immediate Supervisor	Date	Director, Dept. Head or Vice Pres.	Date
Printed Full Name:		Ronald Cotterman	[redacted]
Signature:		Ronald Cott	

For more than 4 inventors, please copy this page and attach it with additional inventor information, signatures and dates: